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THE MEASUREMENT OF THE RELATIVE ECONOMIC STATUS OF FAMILIES

BY EDGAR SYDENSTRICKER AND WILLFORD I. KING

For many centuries people have been spoken of as being rich, well-to-do, or poor. Within broad lines, and for a given time and place, this classification conveys a distinct meaning; but it is not accurate enough for use in scientific analysis. In careful economic research it is insufficient to put into the same class a billionaire and the village banker, even though both are commonly spoken of as rich men. Similarly, the well-to-do and the poor must be divided into subclasses so that different grades of comfort or poverty may be distinguished. How can this subdivision be successfully accomplished?

The usual reply to this query is that it is easy enough to make such a comparison by using income as a criterion. This answer, however, although it appears specific enough is, in reality, extremely vague and indefinite. How is this income comparison to be carried out? How shall we compare the income of the school boy who earns nothing with that of the delivery boy who works by the month? Is the delivery boy rich and the school boy poor? It is perfectly apparent that no such condition can be assumed to exist, for the school boy's parents may be rich and may furnish him with an abundance of everything he needs, while the delivery boy may receive only bare necessities. Evidently, then, personal earnings are entirely unsatisfactory as a criterion of income, and if we would compare individuals as to well-being, we must study the income of the family as a whole and not merely that of the individuals composing it.

This important truth has, unfortunately, been ignored by certain investigators who have assumed that the man who gets good wages is necessarily of a higher income class than the man who gets poorer pay. The exceptions to such a rule are, however, so numerous as largely to invalidate all conclusions based thereon. The determination of individual earnings must, therefore, for purpose of comparing welfare, be regarded as merely a step preliminary to the computation of the net family income.

As most accountants and statisticians can testify, the computation of the family income is in itself a task of considerable difficulty, especially when the facts concerning the family are not all perfectly clear—a condition which is certain to prevail when one deals with data collected

rather rapidly from a large number of families. The following are a few of the difficulties involved:

1. One must differentiate carefully between business expenses incurred in obtaining the net income and consumption expenses paid for out of net income.

2. One must be careful to exclude the income of boarders and visitors who are not part of the economic family even though they are temporarily living under the same roof and sharing in the same food supply.

3. One must include only profits (and not gross receipts) accruing from boarders, lodgers, gardening operations, the rearing of live stock, etc.

But the correct computation of net family income is not the problem here under discussion. Let us assume, therefore, that all such difficulties have been overcome and that the family income has been accurately computed. The real problem—that of comparing families as to their respective income conditions—still awaits solution. An illustration of the difficulties involved may prove helpful. Let us first suppose that the Smiths have an income of \$2,000 a year and that the Clarks have only \$1,800. Which family is better off financially? Manifestly, some data is necessary before the question can be answered. If the Clarks have four children and the Smiths have six, the Smiths are probably poorer than the Clarks. The size of the family is, then, evidently a factor of prime importance.

The solution now appears simple: The Smith family consists of eight persons and the Clark family of six; therefore $\frac{\$2,000}{8} = \250 per capita, while $\frac{\$1,800}{6} = \300 per capita. The Clarks are, therefore,

apparently slightly richer than the Smiths. But let us not be too quick in accepting this conclusion. The Clarks have two children who are nearly grown, attend high school, go to parties, and wear fashionable clothes, whereas the Smith children are all under twelve years of age. Are we sure now that the Clarks are in the better economic circumstances? Such a conclusion is by no means dependable. Evidently the age of the members of the family must also be considered a factor of very great importance.

Furthermore, the Smith children may be all boys and the Clark children all girls, and this fact will certainly affect the quantities of food and clothing required. Sex, therefore, is another factor which affects expenditures much too radically to be safely ignored. When all of these circumstances have been carefully considered, it no longer

appears at all easy to say which family's income enables it to supply more fully its economic needs and wants.

In 1916, when one of the present writers (E. S.) was called upon to make a detailed study of the economic conditions of the population residing in seven cotton mill villages of South Carolina, he was confronted with the need for a reasonably accurate mode of determining the relative income status of each family. Realizing that ratings made according to either total family income or per capita income would be entirely too crude for the purposes in hand, he immediately began to search for some device which would give more satisfactory results. What he needed, he decided, was a scale for each sex showing average relative total maintenance expenses for persons of different ages. No such scales, however, could be found. Nevertheless, there did exist several pairs of scales purporting to show the relative food consumption according to age and sex.

Scales of this last type were not new, for as early as 1795 Foley suggested the idea of constructing them. However, the earliest ones for which the actual records could now be found were those used by Ernst Engel in 1895. He had based his scales primarily upon the variations of individuals in weight per centimeter of height. He proposed that the food requirements of a child in its first year be selected as the unit and that this unit should be called a "quet" in honor of Quetelet.* B. Seeböhm Rowntree had rated, in somewhat the same fashion, the families which he studied in York.† The scales found to be most familiar to Americans were those devised by W. O. Atwater and his associates in the United States Department of Agriculture. They were worked out from data obtained through a combination of feeding experiments and budgetary studies‡ and had, in recent years, been rather widely used. The Atwater study deals with food supply in terms of calories. The unit (known as the Adult Male Unit, and hereafter designated as the A. M. U.) is defined as the need for heat and energy from food to the extent of the average number of calories required to keep a normal young man who is engaged in moderate muscular work in a proper state of health and vigor.

Although scales showing all expenditures rather than merely the needs for food in calories were the things actually sought, still, in their absence, the feasibility of substituting therefor the Atwater food scales was deemed worthy of consideration. It was of course evident that the relative food requirements in calories were not at all the same thing as

* *Lebenskosten Belgischer Arbeiterfamilien*: Bulletin de L'Institut Internationale de Statistique, vol. ix.

† See *Poverty, A Study of Town Life*, chap. viii.

‡ See *Farmers' Bulletin* 142, p. 33, published by the United States Department of Agriculture.

relative total monetary expenditures for all consumption needs, yet it seemed that they might not differ from each other very widely after all. One would scarcely expect differences in age and sex to have an effect upon food expenses different from that which they had upon food needs in calories. It is also quite evident that food is such an important item in the family budget that it cannot fail to play a very important part in determining the distribution of all expenses. Besides, it seemed not unreasonable to suppose that the cost of other articles such as housing, fuel, light, clothing, and furniture, might be divided among persons according to age and sex in much the same proportions as is food.

On the assumption that the disparity was at least not likely to be startling, it was determined to use, during the preliminary investigation, the Atwater scale for measuring the relative sizes of the respective families as expending units. Following this plan, the fraction of an adult male unit for the given age and sex was computed for each person, the fractions thus derived for the various members of a family were added together, and the resulting sum was used as the preliminary estimate of the relative size of the family. This method was applied to all of the families studied. The total income for each family was then divided by the total number of adult male units therein and the resulting quotient, the income per A. M. U., was taken as the economic rating of all members of the household. The households were then classified into income groups having an interval of \$4.00 monthly per A. M. U.

In 1917 the present writers, who were working together, both agreed that the data collected in 1916 and 1917 would furnish a good basis for the construction of scales of the type that had been vainly sought, namely, those showing the actual relative total expenditures for persons of various ages and sexes. It was determined, therefore, to attempt the derivation of such scales.*

The preliminary step was to divide total family expenditures into two parts, namely, food and other, and to work with each part separately. The first part of the main procedure was to derive scales showing the actual average relative expenditures for food for the different ages and sexes. The method decided upon was to use the Atwater scale as a starting point and to make such corrections therein as experience proved to be necessary.

Following this policy, the total food expense per week for each household was divided by the number of A. M. U.'s, which gave the food expense per A. M. U. for each household. It will be remembered that all

* For the original report of this investigation see the article entitled, "Income Classification of Families in Studying Disease Prevalence," *United States Public Health Reports*, November 26, 1920.

the families had been classified upon the basis of approximate monthly income per A. M. U. and were divided into classes having an interval of \$4.00. Each income class was dealt with separately.

Within each income class the percentage of the household which was female was determined, and the families were classified upon this basis. Within each of these subclasses, the average expenditure per A. M. U. for food was determined. These averages were reduced to indices by using the average for the entire income class as a base. The indices for the separate income classes were then averaged, each being weighted according to the respective numbers of A. M. U.'s in the various income classes. The resulting index series showed a tendency to rise slightly as the percentage of the family female grew larger. This indicated the necessity of increasing the relative importance of females in making allowances for food costs. By dividing the Atwater scale for females by 0.964, the resulting quotients were such that when applied they seemed to cause the curve to conform as closely as possible to the actual relative value of food purchased for consumption by females as compared to the similar food value for males.

The adjustment for sex having been made, the next step was to find out what adjustments, if any, should be made for age. The income classification of the families as described above was retained without change. The families within each income class were next divided into three main divisions, namely, families composed of two adults and several children, families composed entirely of adults, and other families. Families in the last division were discarded as being not adapted to the purpose of this study. Families with children were subdivided according to the ages of the children. Families composed of adults were classified according to the average age of the adults. The average money value per A. M. U. of food purchased for family consumption was now compared for different ages, and it was found to be materially less in each income class for old people than for young adults, and to be slightly higher for children than the necessary food supply as indicated by the Atwater scale. A separate index series was obtained for each income class and a weighed arithmetic average of these series of indices was computed. The resulting average series for all classes furnished a series of adjusting factors to be applied to the already once adjusted Atwater scales. Multiplication by these factors produced a pair of scales which purported to show the actual relative expenditures for food for persons of different sexes and various ages.

Since these scales were derived from actual money expenditures for food rather than from the number of calories believed to be necessary for the maintenance of an individual, it was thought best to give a dis-

tinctive name to the unit upon which these original scales were based. The term chosen was *fammain*, it being an abbreviation of the phrase *food for adult male maintenance*. The *fammain* may be accurately defined, for any given class of people, as *a demand for food of a money value equal to that demanded by the average male in the given class at the age when the expense for his food reaches a maximum*.

It will be noticed that the *fammain* is quoted as a *demand for* rather than a *purchase of* food. The *fammain* is conceived of as a psychological attribute of the individual which continuously requires nourishment for its satisfaction. The food purchased depends upon vicissitudes of all kinds and is a most variable thing, whereas the demand is relatively constant.

As stated before, the 1916 investigation was purely preliminary and was intended largely for the development of modes of procedure. The schedules obtained were, therefore, as might be expected, incomplete in certain particulars, and the possible accuracy of the information therefrom was necessarily limited by these imperfections. For instance, the value of home-produced foods had not been calculated and added to the value of purchased foods. Such errors were, wherever possible, eliminated in the 1917 study. As a result, although it has of course been impossible to eliminate from 1917 data certain types of errors which are inseparable from an extensive budgetary study, it is believed that the errors arising in 1916 from the tentative nature of the method and from incompleteness in the calculations have been reduced until they are reasonably small.

With these improved schedules on hand, the next move was to correct the scales of *fammain*s as derived from the 1916 study. The mode of correcting these scales was similar in concept but different in mechanical procedure from that used in making adjustments from the Atwater scale. As a material basis for the work of correction, budgets from about a thousand families were selected and actually used in the computations from which the accompanying indices are derived. These families were resident in twelve South Carolina mill villages, and the schedules were taken in the spring of 1917 before garden produce became abundant. For each family the number of *fammain*s (computed according to the 1916 scales) was added up. The total food expense was divided by the number of *fammain*s to obtain the expense per *fammain*.

It was absolutely necessary that variations in food supply owing to wide differences in income be eliminated; hence a classification of the families on an income basis was essential. Since it was entirely superfluous as well as impracticable to make this classification at all exact,

the approximate method of dividing the total weekly family income by the number of fammains was used. This income per fammain, not strictly scientific as a basis of income classification, was amply accurate for the purposes at hand.

Next, the percentage of all members who were male was ascertained for each family. The expense per fammain for food for the family was then plotted as an ordinate against the percentage of the family male as an abscissa. This was repeated for each family. A straight line was next fitted as closely as possible to the trend of the points located. The tangent of its angle with the horizontal was then measured. The tangents thus obtained showed that the fammain scales derived from the 1916 schedules still failed to allow a sufficient amount for the necessary consumption for females as relative to that of males, the fraction shown being about 3 per cent less than actual relative value of food intended for consumption. All percentages on the 1916 fammain scale for females were therefore multiplied by 1.03.

The next necessary step was to test the 1916 fammain scale for correctness as to age relationships. This was done in the following manner: All families were divided into income classes having an interval of \$1.00 weekly per fammain. For each family within a given income class, the quantity representing food expenditures per fammain was plotted as an ordinate against the average age of the persons in the family. After the points were plotted, the graph sheet was divided into age classes and the median expenditures for each age class was determined. Indices were now derived by dividing the median for each age class by the median for all the age classes. This process was repeated for each income class. The indices thus derived were weighted according to the number in each subclass and the weighted arithmetic average of all the indices within a given age class was obtained for all income classes. These average indices for the various age classes, when compared, showed clearly that the 1916 fammain scales had assigned too small a rating in fammains for the older persons. The fammain scales were therefore adjusted for age as well as for sex. They now purported to show for each sex the correct rating of normal relative expenditures for food at different ages.

Since the changes made had been considerable, however, it seemed best to verify the results and to ascertain whether after the new adjustments were made, the scales actually represented the facts. The number of fammains was therefore recomputed for each of the thousand selected families according to the new scales. Again, food expenditures per tentative fammain were compared for different age classes. It was found that a small further allowance must still be made for persons of

Table I

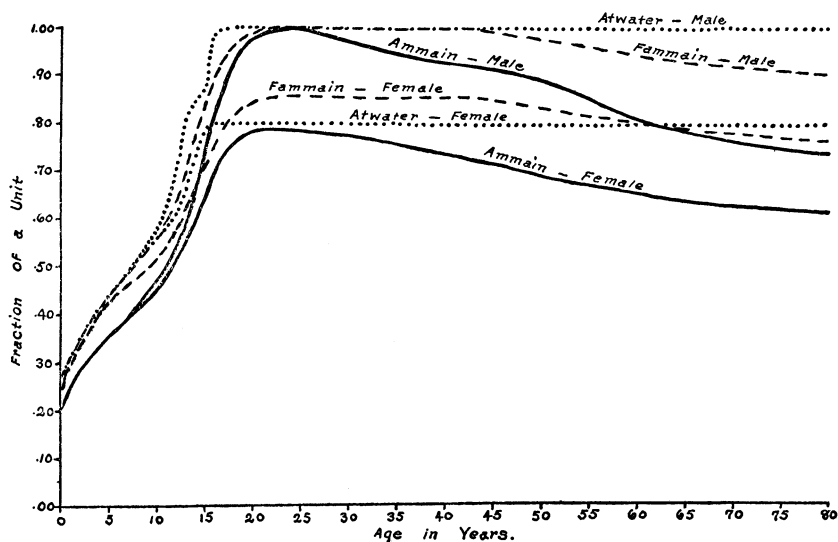
FINAL SCALES OF FAMMANS					
Derived from Food Records of 1500 Families Collected in 1917 from Residents of Twenty Cotton Mill Villages of South Carolina ¹					
Age in Years	Male	Female	Age in Years	Male	Female
Under 1	.278	.265	40	1.000	.858
1	.302	.289	41	1.000	.858
2	.348	.335	42	1.000	.858
3	.381	.371	43	.999	.857
4	.410	.403	44	.997	.854
5	.435	.427	45	.994	.851
6	.460	.447	46	.991	.848
7	.483	.463	47	.988	.845
8	.506	.478	48	.985	.842
9	.531	.492	49	.982	.839
10	.557	.517	50	.979	.836
11	.592	.541	51	.976	.833
12	.639	.576	52	.973	.830
13	.694	.615	53	.970	.827
14	.769	.660	54	.966	.824
15	.837	.715	55	.962	.821
16	.900	.760	56	.958	.818
17	.935	.795	57	.955	.815
18	.965	.820	58	.952	.812
19	.983	.835	59	.949	.809
20	.991	.845	60	.946	.806
21	.998	.853	61	.943	.803
22	1.000	.858	62	.940	.800
23	1.000	.858	63	.937	.797
24	1.000	.858	64	.935	.794
25	1.000	.858	65	.933	.792
26	1.000	.858	66	.931	.790
27	1.000	.858	67	.929	.788
28	1.000	.858	68	.927	.786
29	1.000	.858	69	.925	.784
30	1.000	.858	70	.923	.782
31	1.000	.858	71	.921	.780
32	1.000	.858	72	.919	.778
33	1.000	.858	73	.917	.777
34	1.000	.858	74	.915	.775
35	1.000	.858	75	.913	.774
36	1.000	.858	76	.911	.772
37	1.000	.858	77	.909	.771
38	1.000	.858	78	.907	.770
39	1.000	.858	79	.905	.769
			80	.903	.768

¹. The last decimal place is, in every instance, the result of interpolation and cannot be regarded as accurate.

ages above 34 years. The number of fammains was therefore increased slightly for the higher ages. The ratio between the sexes seemed to be as accurate as could be arrived at; hence no changes were required on this account. The scale as finally adjusted is believed to represent fairly the relative variation with age and sex of expenditures for food under the conditions prevailing in South Carolina cotton mill villages in the spring of 1917.

A glance at the accompanying graph shows that the fammain and the Atwater scales diverge from each other considerably in places. This

THE AMMAIN AND FAMMAIN CURVES,
REPRESENTING CONDITIONS IN THE SOUTH CAROLINA COTTON MILLS IN 1917,
AS COMPARED TO GRAPHS OF THE ATWATER SCALES



leads us to inquire whether or not this divergence is a result of the Atwater scale being based upon measurements in terms of calories, while the fammain scale is based upon money value.

It is evident that unless the food of females costs more per calorie than does that of males, or vice versa, or unless the cost of food per calorie varies with age, the calorie curve and the fammain curve must be identical. In order to ascertain whether costs per calorie actually do or do not vary with age and sex, about twelve hundred families were classified on the basis of those variables, and the food supply of each class was studied as to its calorific content. The results showed no correlation

whatever between either age or sex and the food cost per calorie. The conclusion must be that the fammain curve represents the demand for food equally well, whether it is expressed in terms of calories or of money cost. This interchangeable character makes the fammain scale doubly useful.

But food is only one of the items of the family budget. Any scale adequate for use in the accurate classification of families upon an income basis must take into consideration expenditures for other purposes as well. Now articles of different kinds can be added only when all are first reduced to a common denominator. The only common unit of measurement for food, clothing, entertainment, etc., which can be readily applied to the various articles is the dollar's worth; hence it was necessary to consider food as well as all other classes of commodities in terms of money value. It was certainly impracticable, and probably wholly useless as well, to attempt to ascertain the quantities of the various articles actually *consumed* by individuals. It proved feasible, however, to secure the housewife's estimate of the amount and value of each class of articles, except food, purchased for the various members of the family for purposes of current consumption during the preceding twelve months, and inquiries were made to this end. The ultimate object was to secure indices showing the relative purchases of the articles to be used by persons of different ages and sexes, and then to combine these indices with similar ones for food. The ordinary schedules taken in 1917 covered expenditures for food only. It was therefore necessary to undertake a special inquiry to ascertain how other expenditures were apportioned among individuals of different ages and sexes. For this purpose information was secured from some three hundred families, an estimate being obtained from some member of each family, usually the housewife, of the total expenses incurred during the preceding twelve months for each of thirty of the leading categories of purchases for the family budget, these categories including only articles of such a nature that they could readily be apportioned to individuals, as, for example, various articles of clothing, medical expense, recreation, and schooling. In addition, a statement was obtained of the family expense incurred for rent, fuel, light, and twenty-eight minor items. By use of the data thus obtained from the family, together with records secured from the merchants of the food sold from their stores to each family during sample periods, an effort was made to balance the family income and expenditures for the twelve-month period before the schedule was taken. Nearly half of the schedules failed to balance within a reasonable margin of error. All such schedules were rejected, leaving for consideration reasonably

satisfactory schedules for 140 families comprising 672 individuals. These 140 families were classified upon the basis of income per fammain (using the 1916 scale which was satisfactory enough, since for the purpose in hand it was necessary to obtain only a very crude approximation to the actual income rating of the family). The individual items for the persons of each sex within a given income class were plotted one by one, using age as an abscissa and actual expenditures for the given person's individual needs as ordinates. By a modification of the moving average method, a smoothed curve was derived for each income class from the points indicating the positions of the various items. These curves were weighted according to the number of individuals in each income class and were thereafter combined into one curve which was then smoothed. The quantities entered in Table II were read from this curve.

The index series for food was now combined with the similar series for expenditures for other articles purchased specifically for individuals, each series being weighted in proportion to the average money expended for all the individuals of each sex for food and for other articles respectively. The combined index is recorded in Table III. It takes into consideration all of the principal ordinary expenditures except those for rent (a small expense in mill villages), fuel and light, and furniture, and actually includes about 89 per cent of the total family expenditures. It seems probable that the remaining 11 per cent is apportioned in a ratio sufficiently similar to that representing the items used in deriving the scales just mentioned to make these scales fair criteria of the ordinary relative expense for maintenance of individuals of different ages and sexes among the families studied.

These scales evidently differ from the fammain scales and have a different unit as a base. The unit, in this instance, may be defined for any given class of people, as a *gross demand for articles of consumption having a total money value equal to that demanded by the average male in that class at the age when his total requirements for expense of maintenance reach a maximum*. This unit may be denominated as an *ammain*. It differs from the "adult male unit" of the Atwaterscale in that it is based upon demand for all maintenance and not merely upon that for food, and in that it is a measure of *money value* of actual expenditures and not of *calories* to meet bodily needs. It differs from the fammain only in that it includes all expenditures and not merely those made for food. The term *ammain* is an abbreviation of the words *adult male maintenance*. The excuse for the coinage of the terms *ammain* and *fammain* lies only in the fact that the concepts included therein cannot be expressed accurately in ordinary English except by long descrip-

Table II

RELATIVE EXPENDITURES FOR PERSONS OF DIFFERENT
AGES AND SEXES FOR ARTICLES PURCHASED FOR
USE BY A SPECIFIC INDIVIDUAL

AS shown by the Budgets of 140 Families in the Cotton
Mill Villages of South Carolina for a Twelve
Month Period Ending in 1917.

Age in Years	Male	Female	Age in Years	Male	Female
Under 1	.11	.11	40	.81	.45
1	.13	.13	41	.80	.44
2	.16	.16	42	.79	.43
3	.17	.17	43	.79	.41
4	.19	.18	44	.78	.40
5	.20	.19	45	.78	.38
6	.22	.21	46	.77	.37
7	.24	.23	47	.76	.36
8	.26	.25	48	.76	.35
9	.28	.27	49	.75	.35
10	.31	.30	50	.74	.34
11	.33	.33	51	.73	.33
12	.35	.37	52	.71	.33
13	.40	.40	53	.69	.32
14	.46	.44	54	.67	.32
15	.55	.48	55	.64	.31
16	.65	.57	56	.62	.30
17	.77	.60	57	.61	.30
18	.86	.61	58	.60	.29
19	.92	.63	59	.58	.29
20	.95	.63	60	.57	.28
21	.96	.63	61	.56	.28
22	.98	.63	62	.55	.27
23	.99	.62	63	.54	.27
24	1.00 ^a	.61	64	.53	.27
25	1.00	.60	65	.52	.26
26	.99	.60	66	.51	.26
27	.97	.59	67	.51	.26
28	.95	.59	68	.50	.26
29	.94	.58	69	.49	.26
30	.92	.58	70	.49	.26
31	.91	.57	71	.48	.26
32	.89	.55	72	.47	.25
33	.88	.54	73	.47	.25
34	.87	.52	74	.46	.25
35	.85	.50	75	.46	.25
36	.84	.49	76	.45	.25
37	.83	.48	77	.45	.25
38	.82	.47	78	.44	.25
39	.82	.46	79	.44	.25
			80	.43	.25

a. Average expenditure for a man 24 years of age = \$100.79.

tive sentences, and experience has amply proved that it is far better to coin words outright than to use existing words capable of double interpretations.

It will be observed that the scales of fammains, as might be expected, differ but slightly from the Atwater scales which represent basal food requirements in calories, while the scales for ammains are distinctly dissimilar to those representing expense for food or necessary food requirements.

Table III

FINAL SCALES OF AMMAINS

Derived From Complete Budgets of 140 Families and from
Food Records of 1500 Families Collected in 1917 from Residents
of Twenty Cotton Mill Villages of South Carolina.

Age in Years	Male	Female	Age in Years	Male	Female
Under 1	.220	.220	40	.931	.739
1	.241	.241	41	.928	.735
2	.281	.281	42	.925	.731
3	.306	.306	43	.922	.727
4	.332	.332	44	.919	.723
5	.352	.352	45	.916	.718
6	.375	.375	46	.912	.713
7	.397	.396	47	.908	.708
8	.419	.412	48	.904	.703
9	.442	.429	49	.899	.698
10	.470	.451	50	.894	.693
11	.499	.481	51	.888	.689
12	.537	.514	52	.881	.685
13	.590	.553	53	.873	.681
14	.657	.596	54	.864	.677
15	.736	.648	55	.854	.673
16	.812	.705	56	.844	.669
17	.876	.739	57	.834	.666
18	.928	.760	58	.825	.663
19	.960	.776	59	.818	.660
20	.976	.783	60	.812	.657
21	.986	.789	61	.807	.654
22	.992	.790	62	.802	.651
23	.996	.790	63	.797	.648
24	1.000	.788	64	.792	.645
25	1.000	.786	65	.788	.642
26	.996	.784	66	.784	.639
27	.990	.782	67	.780	.636
28	.984	.780	68	.776	.634
29	.978	.778	69	.772	.632
30	.972	.776	70	.768	.630
31	.967	.773	71	.764	.628
32	.962	.770	72	.760	.626
33	.957	.767	73	.757	.625
34	.952	.763	74	.754	.623
35	.948	.759	75	.751	.622
36	.944	.755	76	.749	.620
37	.940	.751	77	.747	.619
38	.937	.747	78	.745	.618
39	.934	.743	79	.743	.617
			80	.741	.616

1. The last decimal place is, in every instance, the result of interpolation and cannot be regarded as accurate.

Although the ammain and fammain scales here presented are probably fairly representative of expenditures for persons of different ages and sexes among the cotton mill workers of South Carolina, it does not follow that the same relative expenses of maintenance would be strictly applicable to other classes of workers. The existence of such similarities or differences can be determined only by investigation. It might be said, however, that for the families considered in the present study, differences in income did not seem radically to affect the character of the scales. However, there were too few families of high income to afford an adequate basis for any definite conclusions as to whether extreme income variations do or do not have any tendency to modify the shape of the curves. It seems not improbable, nevertheless, that in social classes differing widely from those studied, expense for clothing for different ages and sexes might noticeably diverge from the present scales. The scales here cited, therefore, although believed to be reasonably accurate for the given class of workers in the locality under consideration, may prove somewhat inaccurate if applied to different classes of persons or to the same class in other localities.

However, for studies in which it is impracticable to work out an original scale of ammain or fammain, it is evident that these scales may be used for the purpose of improving very notably the accuracy of the family income rating over that which could be secured simply by dividing the income for the family by the number of individuals composing it or, still more crudely, by merely using the income for the family as a whole.

In fact, for studies of working-class families anywhere, if the classification according to income does not need to be extraordinarily exact, it will probably be sufficient to use the present scales as they stand.

The practical method of applying the fammain and ammain scales is shown in the following example:

SMITH HOUSEHOLD

Name	Age	Sex	Position in family	Number of fammains	Number of ammain
John.....	38	M	head	1.00	.94
Mary.....	34	F	wife	.86	.76
Fred.....	12	M	son	.64	.54
Oliver.....	10	M	son	.56	.47
Clinton.....	8	M	son	.51	.42
James.....	6	M	son	.46	.38
Harry.....	4	M	son	.41	.33
George.....	2	M	son	.35	.28
Total for family.....				4.79	4.12

Total annual family income = \$2,000
 Income per ammain = $\$2,000 \div 4.12 = \485
 Total annual expenditure for food = \$600
 Annual food cost per fammain = $\$600 \div 4.79 = \125

CLARK HOUSEHOLD

Name	Age	Sex	Position in family	Number of fammains	Number of ammainns
Clark, Samuel.....	45	M	head	.99	.92
Clark, Edith.....	41	F	wife	.86	.74
Clark, May.....	18	F	daughter	.82	.76
Clark, Gladys.....	16	F	daughter	.76	.71
Clark, Julia.....	13	F	daughter	.62	.55
Clark, Evelyn.....	11	F	daughter	.54	.48
Jones, William.....	28	M	boarder	1.00	
Ross, Jennie.....	24	F	boarder	.86	
Total for dietary group.....				6.45	
Total for economic family.....					4.16

Total annual family income = \$1,800
 Income per ammain = $\$1,800 \div 4.16 = \434
 Total annual expenditure for food = \$780
 Annual food cost per fammain = $\$780 \div 6.45 = \121

We can now proceed to answer intelligently the question propounded at the beginning of the discussion as to whether the Clark family is richer or poorer than the Smith family. A comparison of their respective incomes per ammain is all that is necessary. We see that although their per capita income is slightly less, the Smith family is distinctly better off, the ratio of their income to that of the Clark family being as \$485 is to \$434. A comparison of the respective values of food used per fammain shows us, however, that the members of the Clark family, perhaps because they keep boarders, perhaps for other reasons, have nearly as abundant a food supply as do the Smiths. The Clarks, then, must perforce economize more diligently than the Smiths in other lines of expenditure.

This study is presented with a full realization that it is only a beginning and not a finality in this field. Its prime object is to call attention to the absolute necessity of prefacing all attempts to classify families upon an income basis by ascertaining:

1. The age and sex composition of the family.
2. The number of ammainns composing the family.
3. The total net income for the family.
4. The net family income per ammain.

If it is desired to make a comparison, not according to income but according to the food supply of the persons eating at the family table, the sequence of the steps then would become:

1. The age and sex composition of the dietary group.
2. The number of A. M. U.'s or fammains composing the dietary group.
3. The total number of calories or total value of food consumed by the dietary group.

4. The number of calories per fammain consumed or the number of dollars per fammain expended for food during the period in question.

With this information at hand it is possible to proceed intelligently with further investigations requiring, as a prerequisite, knowledge of the income, dietary conditions, or general economic welfare of the families in question. Without such a systematic rating of families, the results of income or dietary studies are always affected with such a wide margin of error as to cast serious doubt upon the accuracy of any except the most strikingly evident conclusions which may be derived therefrom.